

REMARKS

Applicants request reconsideration of the present application in view of the foregoing amendments and the following remarks.

I. Status of the Claims

Claims 1, 3, 4, 16, 19, 24-26 and 28-33 are pending. Claims 18, 21 and 22 have been canceled without prejudice or disclaimer. The cancellation of claims made herein does not constitute acquiescence in the propriety of any objection or rejection made by the Examiner, but is made merely to advance the case towards allowance. Applicants, however, reserve their right to file continuing applications in respect of the subject matter of these claims. Claims 19, 25 and 26 have been amended to more particularly point out and distinctly claim the invention. Claims 28-33 have been added. Support of these claims can be found throughout the specification together with the pending claims, for example, claims 1, 19, 24 or 25.

II. Objection to the Specification

The Examiner has maintained the objection to the specification despite of the amendment of the specification to provide explicit sequence identification numbers within the Brief Description of the Drawings. Specifically, the Examiner asserts that Applicants have not clarified the differences between the submitted sequences and those shown in the figures as originally filed.

Contrary to the Examiner's understanding, the new "Brief Description of the Drawings" replaced by the previous amendment does provide clear explanation on how the submitted sequences are related to those shown in the figures. In the previous Office Action, paper No. 28, the Examiner questions about the difference in the number of nucleotides, specifically, between Fig 2A (988 nucleotides) and SEQ ID

NO:3 (1830 nucleotides), and between Fig 2B (321¹ nucleotides) and SEQ ID NO:5 (1878 nucleotides). The new description on Figure 2 clearly explains it.

As an initial matter, Applicants note that Figs 2A and 2B originally filed were substituted with Figs 2A, 2B and 2C in the amendment submitted August 7, 1997. Therefore, Applicants address this issue citing the substituted figures. In addition, Applicants submit that it is proper to compare the nucleotides shown in Fig 2A with SEQ ID NO:4, which is a sequence listing of the nucleic acids encoding the amino acids of SEQ ID NO:3. For the same reason, Fig 2B should be compared with SEQ ID NO:6 rather than SEQ ID NO:5 for amino acids.

As illustrated in the second paragraph of the new "Brief Description of the Drawings," Fig 2A shows only a part of the nucleotide sequence of MDK1.T1, which begins with nucleotide 1913 of SEQ ID NO:4 and ends at 2901 of SEQ ID NO:4. Thus, this explains why the number of the nucleotide sequence shown in Figure 2A is 988. Similarly, Fig 2B shows a part of the nucleotide sequence of MDK1.T2, which begins with nucleotide 1913 of SEQ ID NO:6 and end at 2323. Thus, this clarifies the reasons for the difference in the number between the nucleotide sequence in Fig 2B and SEQ ID NO:6.

Fig 2C shows MDK1.Δ1 with 88² amino acids and MDK1.Δ2 with 89³ amino acids, respectively. Thus, as the Examiner indicates, there are differences in the number of amino acids between amino acids shown in Fig. 2C and their corresponding SEQ ID NOs: 11 and 12. However, it is easily understood from the new description on Fig 2C that this discrepancy in the number of amino acids arises from the fact that Fig 2C presents amino acid sequences of a certain region of MDK1.Δ1 and MDK1.Δ2, which begin at amino acid residue number 535 in MDK1.Δ1 and MDK1.Δ2 and end at 623 in MDK1.Δ1 and at 624 in MDK1.Δ2, respectively. As demonstrated in a

¹ Applicants found that the number of nucleotides shown in Fig 2(B) is 400, not 321.

² Applicants found that the number of amino acids of MDK1.delta1 in Fig 2C is 88 rather than 87.

³ Applicants found that the number of amino acids of MDK1.delta2 in Fig 2C is 89 rather than 88.

schematic representation, the amino acid sequences of the rest parts of MDK1.Δ1 and MDK1.Δ2 correspond to the MDK1(SEQ ID NO:2), thereby leading to complete full amino acid sequences of MDK1.Δ1 and MDK1.Δ2, as shown in SEQ ID NOs: 11 and 12, respectively.

Applicants respectfully submit that the above explanation is fully responsive to the Examiner's concern and thus, withdrawal of the objection is requested.

III. Rejection based on 35 USC §101

The Examiner has rejected claims 18, 19, 21, 22 and 26 under 35 USC §101 for the lack of a specific asserted utility or a well-established utility. The Examiner contends that neither the specification nor any art of record teaches what the claimed sequences which do not encode tyrosine kinases domains are, or what they do and it fails to teach a utility for any of the fragments claimed and a relationship to any specific diseases or establish any involvement in the etiology of any specific diseases.

Without acquiescing to the propriety of the Examiner's position on this rejection, Applicants have obviated this rejection by canceling claims 18, 21 and 22 and amending claims 19, 25 and 26, as suggested by the Examiner. Specifically, claim 19 has been amended to delete reference to SEQ ID NOs: 3 and 5, claim 25 has been amended to delete combinations other than those reciting the sequence encoding amino acids 580-998 of SEQ ID NO:2 or their complete complement. Claim 26 also has been amended to delete reference to claim 18, 21 and 22, which have been cancelled herein.

Accordingly, the rejection becomes moot and withdrawal of the rejection is respectfully requested.

IV. Rejection based on 35 USC §112, first paragraph

A. Enablement

The Examiner has rejected claims 18, 19, 25 and 26 under 35 USC §112, first paragraph as non-enabled because one skilled in the art would not know how to use the claimed invention due to lack of utility. For the same reasons set forth in response to the rejection for the lack of utility, accompanied by the amendment of claims made herein, Applicants respectfully submit that the rejection is moot and therefore, withdrawal of the rejection is requested.

B. Written Description

The Examiner also has rejected claims 1, 16, 19, 25 and 26 under 35 USC §112, first paragraph, for failing to meet the written description requirement. The Examiner asserts that because the specification teaches that "isolated" nucleic acid includes DNA isolated from a natural source by specifically making a distinction between natural DNA and cDNA, these claims read on the natural gene encoding the claimed polypeptide, which would be expected to have both introns and exons as well as regulatory elements. The Examiner is of opinion that the structure of the genes encoding the claimed polypeptides are not defined because it is not possible to work backward from the cDNA to derive a gene. The Examiner further opines that only an isolated polynucleotide comprising SEQ ID NOs: 2, 3, 5, 11 and 12⁴ meets the written description provision of 35 USC §112, first paragraph. Applicants respectfully traverse this rejection.

The U.S. Patent and Trademark Office published on December 21, 1999 in the Federal Register (64 Fed. Reg. 71427) its revised interim guidelines for written description. First, the guidelines counsel examiners to review the entire specification

⁴ SEQ ID NOs: 2, 3, 5, 11 and 12 illustrate amino acid sequences of MDK1, MDK1.T1, MDK1.T2, and MDK1. T1, and MDK1. T2, respectively. Thus, these SEQ ID NOs should be SEQ ID NOs: 1, 4 and 6, which illustrate nucleic acids encoding MDK1, MDK1. T1, and MDK1. T2.

and then determine whether all subject matter that is essential to the invention is actually recited in the claims. See Guidelines at II(A)(2).

Next, the examiners must determine whether the applicant was in possession of all that is claimed. *Id.* at II(A)(3). Possession can be shown by disclosure of structural characteristics, functional characteristics that correlate with structure or combinations thereof. *Id.* at II(A)(3)(a). Applicants submit that the below discussion will demonstrate how Applicants have possession of the claimed invention.

Degeneracy of the genetic code is where more than one codon specifies a particular amino acid. The instant specification provides a specific guidance with respect to the degeneracy of the genetic codes for specifying amino acid sequences for MDK1, MDK1.Δ1 and MDK1.Δ2. See page 31 of the specification. Furthermore, the phenomenon of codon degeneracy is well known to those of skill in the art, and a skilled artisan could readily substitute degenerate codons for those shown in SEQ ID NOs: 2, 11 and 12. Therefore, Applicants clearly were in possession of polynucleotides in addition to those specifically set forth in the sequences printed in the specification. By providing the amino acid sequences for MDK1, MDK1.Δ1 and MDK1.Δ2, the specification reasonably conveys to one skilled in the relevant art that Applicants were in possession of any number of polynucleotides which encode the recited amino acid sequence and differ as a result of codon degeneracy.

Furthermore, it is within the ordinary skill in the art to design a probe based on the DNA sequences and then to screen a DNA library in accordance with the known gene-cloning method to isolate a DNA, regardless of cDNA or genomic DNA, encoding protein. In fact, the instant application discloses nucleic acid sequences of a full-length DNA encoding MDK1, MDK1.Δ1 or MDK1.Δ2, which include the nucleic acid sequences essential for the function or structure of the corresponding proteins. Given the art's knowledge of the genetic code, and routine DNA screening technology, one of ordinary skill in the art would have readily apprehend that any isolated, purified or enriched nucleic acid molecules encoding MDK1, MDK1.Δ1 and MDK1.Δ2 or

completely complementary nucleic acids thereof were in possession of Applicants as of filing date of the instant application.

Therefore, a requirement that Applicants amend the claims to recite the polynucleotide sequences specifically set forth in the specification would allow those of skill in the art to profit unfairly based on Applicants' contribution to the art. Reconsideration and withdrawal of the rejections is respectfully requested.

V. Rejection based on 35 USC §112, second paragraph

The Examiner has rejected claims 26 and 18 under 35 USC §112, second paragraph as indefinite. Applicants note that reference to claim 17 was deleted in claim 26 in the previous amendment filed on April 13, 2000. Thus, Applicants respectfully submit that the rejection of claim 26 was incorrect. In addition, cancellation of claim 18 renders the rejection moot. Accordingly, withdrawal of the rejection is respectfully requested.

VI. Rejection based on 35 USC §102, first paragraph

The Examiner has rejected claim 18 as anticipated by WO9300425. Because the rejection is moot by cancellation of claim 18, Applicants respectfully request that the rejection be withdrawn.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and allowance of the pending claims. If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner hereby is respectfully invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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